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Finding allowable deformation of the road roller shell with variable curvature(Article)

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Краткое описание

The article examines a new mechanic and mathematical model for the conditions of the roller flexible shell of the road roller assessing its load bearing capacity, reliability and strength and making it possible, depending on the properties of the material to be compacted, to select abroad roller with the required performance of rollers before the work is started. It also reviews issues related to the acceptable transformation of the flexible shell circular surface and allowable displacementlimit while exceeding ofthe latter may lead to a failure of the road roller capability. The article is aimed at giving scientific evidence and finding feasibility of using flexible shells in the road roller design and determining their parameters that are sufficiently accurate to be used for engineering purposes. It also describes the experimental equipment used to investigate the parameters of flexible shells and presents practical effect in the form of schematics and full-scale structures, as well as an experimental roller of a road roller with a flexible steel shell. The results complement and integrate into previous studies and they are compared with analytical and elemental solutions of similar tasks from the scientific literature [7, 9, 13, 14].